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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,728	11/06/2001	Mohammad A. Abdallah	42390P5943C	2359

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EXAMINER

ELLIS, RICHARD L

ART UNIT	PAPER NUMBER
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2183

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DATE MAILED: 08/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/005,728	Applicant(s) ABDALLAH ET AL.	
	Examiner Richard Ellis	Art Unit 2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 16-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3-4.                      6) ☐ Other: .

1. Claims 16-44 are presented for examination.
2. Claims 17, 21-24, and 26-38 are rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. The claims contain a trademark and/or trade name. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. A claim which uses a trademark or trade name as a limitation to identify or describe a particular material or product does not comply with the requirements of 35 USC § 112 2<sup>nd</sup> paragraph. *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. In fact, the value of a trademark would be lost to the extent that it became descriptive of a product, rather than used as an identification of a source or origin of a product. Thus, the use of a trademark or trade name in a claim to identify or describe a material or product would not only render a claim indefinite, but would also constitute an improper use of the trademark or trade name. The claims in question contain following trademark or trade name: "PENTIUM"
  - 3.1. The scope of meaning of the following terms are unclear:
    - 3.1.1. "wherein performing the first operation ... [comprises] ... produce[ing] a first plurality of partial products" claims 21 and 33; It is unclear how the first operation can be performed by producing partial products (multiplication) when claim 16 defines the first operation as a packed sum of absolute differences (subtraction, absolute value, addition). It appears that applicant meant to write "wherein performing the secondfirst operation" in the claim.
4. The following is a quotation of 35 USC § 103 which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
  - (c) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

5. This application currently names joint inventors. In considering patentability of the claims under 35 USC § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 USC § 102(f) or (g) prior art under 35 USC § 103.

6. Claims 16-44 are rejected under 35 USC § 103 as being unpatentable over Sidwell, U.S. Patent 5,859,789, in view of *Visual Instruction Set (VIS (TM)) User's Guide*, Sun Microsystems, March 1997 ("Sun").

Sun was cited as a prior art reference in applicant's information disclosure statement, paper number 4, received January 7, 2002.

Sidwell taught (e.g. see figs. 1-6) the invention substantially as claimed (as per claim 16), including a data processing ("DP") system comprising:

- 6.1. a decode unit (fig. 1, 16) to decode a plurality of packed data instructions (col. 6 lines 5-23) including a packed multiply-add (PMAD) instruction (col. 7 lines 20-27) having a second format to identify a second set of packed data (inherent), said decode unit to initiate a second set of operations on the second set of packed data responsive to decoding the PMAD instruction (fig. 1, "PACK OPS", "6, "OP", col. 3 lines 61-64); and,
- 6.2. an execution unit to perform a second operation of the second set of operations initiated by the decode unit (fig. 1, 6).

7. Sidwell did not teach that the system additionally included an instruction for performing a packed sum of absolute differences (PSAD) instruction. Sun taught an instruction for performing a packed sum of absolute differences (PSAD) instruction (pg. 87-88, section 4.7.11, instruction "vis\_pdist()"). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Sun's packed sum of absolute differences (PSAD) instruction into Sidwell's system because Sidwell taught that the packed arithmetic unit performed additional operations (col. 5 lines 15-22) and Sun taught that a packed sum of absolute differences (PSAD) instruction was beneficial in accelerating motion compensation to support real-time video compression (pg. 88).

8. As to claim 17, Sidwell in view of Sun did not teach that the system processed the PENTIUM (TM) microprocessor instruction set. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have made the system compatible with the PENTIUM (TM) microprocessor instruction set because the PENTIUM (TM) instruction set was by far the most widely used microprocessor instruction set in the world at the time of invention, and by making the system compatible with the PENTIUM (TM) instruction set, the system is immediately compatible and useful to the widest variety of programs available, yielding instant sales and profitability.
9. As to claim 18, Sun taught that the set of operations for the packed sum of absolute differences (PSAD) instruction was implemented by performing a packed subtract and write carry (pg. 87, "The pixels are subtracted from one another, pair wise"); a packed absolute value (pg. 87, "the absolute values of the differences are [taken]"); and a packed add horizontal (pg. 87, "the absolute values of the differences are accumulated into *accum*. Note that the destination register is a double-precision floating-point register, which contains an integral value").
10. As to claim 19, Sun taught that the first operation was performed by subtracting one of a plurality of elements of a first packed data of the first set of packed data from a corresponding one of a plurality of elements of a second packed data of the first set of packed data to produce a first result having a plurality of difference elements and a plurality of sign indicators (pg. 87, "The pixels are subtracted from one another, pair wise ...").
11. As to claim 20, Sun taught that the first format identifies the first set of packed data as packed bytes (pg. 43, "vis\_f32", "vis\_d64").
12. As to claim 25, Sun taught that performing the first operation caused the execution unit to receive a plurality of difference elements and a plurality of sign indicators (pg. 87, "The pixels are subtracted from one another, pair wise ..."), produce a result having a plurality of absolute value elements (pg. 87, "the absolute values of the differences are [taken]"), each absolute value element produced by subtracting one of the plurality of difference elements from

a corresponding constant value if the sign indicator corresponding to that element is in a first state, or adding one of the plurality of difference elements to a corresponding constant value if the sign indicator corresponding to that element is in a second state (this portion of the claim simply claims the definition of the mathematical operation "absolute value", where a positive number is added to zero (remaining positive), while a negative number is subtracted from zero (inverting the sign to be positive. Sun's statement that the absolute values are taken means they are using the definition of "absolute value" which is what applicant has claimed).

13. As to claim 26, Sidwell in view of Sun taught the elements of the claim in common with claims 16-17 as detailed, supra. Additionally, Sidwell taught a bus to provide the first set of packed data to the execution logic for performing the first operation (fig. 1, 52, 54).
14. As to claim 27, Sidwell did not specifically teach that the decode-logic comprised a look-up table. However, utilizing lookup tables for decoding instruction opcodes into their basic operations has been a well known practice within the processor art for a very lengthy time (this technique is known as microcoding) and official notice of such is hereby taken. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have microcoded Sidwell's decoder because of the well known advantages of micro-coded decoders of ease of implementation and ease of modification if a bug is discovered in the implementation.
15. As to claim 28, Sidwell's decode logic inherently comprised integrated circuitry.
16. As to claim 29, Sidwell taught that the decode logic [contained] executable operations (col. 3 lines 61-64).
17. As to claim 30, Sun taught that the PSAD instruction was implemented as a packed subtract and write carry (PSBWC) operation (pg. 87, "The pixels are subtracted from one another, pair wise"), a packed absolute value and read carry (PABSRC) operation (pg. 87, "the absolute values of the differences are [taken]"), and a packed add horizontal (PADDH) operation (pg. 87, "the absolute values of the differences are accumulated into *accum*. Note that the destination register is a double-precision floating-point register, which contains an

integral value").

18. As to claim 31, Sidwell in view of Sun taught the features as detailed in the rejection of claim 20, supra.
19. As to claim 32, Sidwell in view of Sun taught the claimed features as detailed in the rejection of claim 19, supra, and additionally taught storing the plurality of difference elements and sign indicators (pg. 87, "The pixels are subtracted from one another, pair wise, and the absolute values of the differences are [taken]").
20. As to claim 33, Sidwell taught
21. As to claim 35, Sidwell taught that the decode unit decoded a packed multiply-add (PMAD) instruction (col. 7 lines 23-27) having a second format (inherent) to identify a second set of packed data (col. 8 lines 23-24, "muladd2ps R6, R4, R5"), said decode unit to initiate a second set of operations on the second set of packed data responsive to decoding the PMAD instruction (col. 3 lines 61-64).
22. As to claim 36, Sidwell taught execution [sic] unit to perform a second operation of the second set of operations initiated by the decode unit (col. 3 lines 61-64 and col. 7 line 20-55).
23. As to claim 37, Sidwell taught that the second format identified the second set of packed data as packed words (col. 7 lines 23-27).
24. As to claim 38, Sidwell in view of Sun taught this claim as detailed in the rejection of claim 25, supra.
25. As to claim 39, Sidwell in view of Sun taught the elements of the claim in common with claim 16 as detailed, supra. Additionally, Sun taught that the packed sum of absolute differences (PSAD) instruction was implemented by performing a packed subtract and write carry (pg. 87, "The pixels are subtracted from one another, pair wise"); a packed absolute value (pg. 87, "the absolute values of the differences are [taken]"); and a packed add horizontal (pg. 87, "the absolute values of the differences are accumulated into *accum*. Note that the destination register is a double-precision floating-point register, which contains an integral value").

26. As to claims 40-42, Sidwell in view of Sun taught these claims as detailed in the rejections of claims 20, 32, and 38 respectively.

27. Claims 21-24, 33-34, and 43-44 are rejected under 35 USC § 103 as being unpatentable over Sidwell, U.S. patent 5,859,789, in view of Sun, *Visual Instruction Set (VIS (TM)) User's Guide*, Sun Microsystems, March 1997, and further in view of Lee, U.S. Patent 5,721,697.

Lee was cited as a prior art reference in applicants information disclosure statement, paper number 4, received January 7, 2002.

Sidwell in view of Sun taught the features of the claims as detailed, supra. Sidwell in view of Sun did not teach the claimed aspects of claims 21, 33 or 43. However Lee taught the features of the claims (taking claim 21 as exemplary) of producing a first plurality of partial products in a multiplier having a plurality of partial product selectors (col. 2 lines 21-26); inserting an element of a first plurality of elements of a first packed data into and substituting for bit positions of one or more of the first plurality of partial products by using partial product selectors corresponding to the bit positions (col. 5 lines 35-56 and table 5); and adding the first plurality of elements together to produce a first result including a field comprising a sum of the first plurality of elements (table 5, "ZZZZZ", col. 5 lines 54-55), said field having a least significant bit (table 5, right most "Z" bit).

Claims 33 and 43 also correspond to the teachings of Lee in a similar manner.

28. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Lee's teachings into a system containing the teachings of Sidwell and Sun because of Lee's teachings that the conventional manner of performing a tree addition is to perform plural operations over many cycles and consequently taking a long time (col. 1 lines 29-35). Lee provides a system for performing a tree add operation in fewer cycles with only minor changes to an existing multiplication circuit (col. 2 lines 1-2) for the purposes of accelerating video compression operations (col. 1 lines 20-29 and 36-40).

29. As to claims 22, 34, and 44, Lee taught shifting the first result to produce a second result having a least significant bit position and to align the least significant bit of the field with




the least significant bit position of the second result (col. 5 lines 55-56).

30. As to claim 23, Lee taught performing this tree add operation as detailed in the rejection of claim 21, supra. It is inherent that it would be repeated more than once within the system in order to perform any meaningful video compression.
31. As to claim 24, Sidwell taught that the second format identifies the second set of packed data as packed words (col. 7 lines 23-27).
32. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.
33. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) days from the mail date of this letter. Failure to respond within the period for response will result in **ABANDONMENT** of the application (see 35 USC 133, MPEP 710.02, 710.02(b)).
34. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Richard Ellis whose telephone number is (703) 305-9690. The Examiner can normally be reached on Monday through Thursday from 7am to 5pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Eddie Chan, can be reached on (703) 305-9712. The fax phone numbers for this Group are: After-final: (703) 746-7238; Official: (703) 746-7239; Non-Official/Draft: (703) 746-7240.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Richard Ellis  
August 14, 2003



**RICHARD L. ELLIS**  
**PRIMARY EXAMINER**